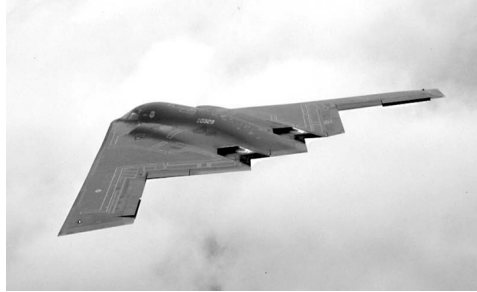


Lesson 7

SPECTRUM MANAGEMENT

Consideration of spectrum is essential and integral to successful program management, system development and fielding of global capabilities

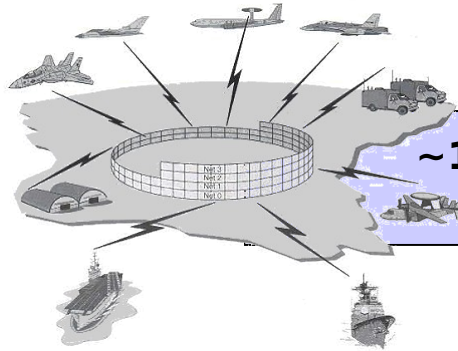
Don't Let This Happen To You!



Cost: B2 Radar - AN/APQ-181

2003 - RADAR redesigned to conform
to National Table of Allocation

**Cost
\$700M**



Schedule: JTIDS*

~1975-2003 - System developed in wrong band,
OCONUS supportability limited

**15 Years
of Delays**



Performance: NTDR**

Can not operate as intended, requires
bandwidth well in excess of spectrum
allocation scheme.

**Degraded
QoS**

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*Joint Tactical Information Distribution System

**Near Term Digital Radio

Spectrum Supportability

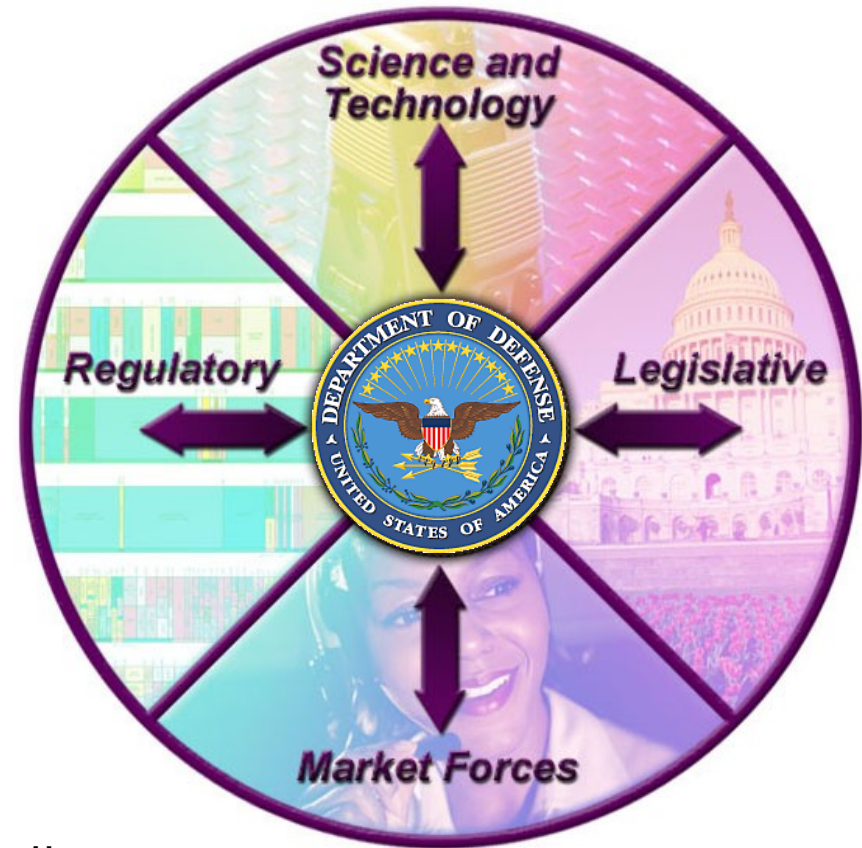
Addresses the availability of sufficient electromagnetic spectrum for the development, training, and compatible operations of spectrum dependent systems in their intended operational environment.



Vision: All systems fielded can obtain spectrum assignments and operate in such a way as to provide the capability (the warfighter) needed when the requirement was generated

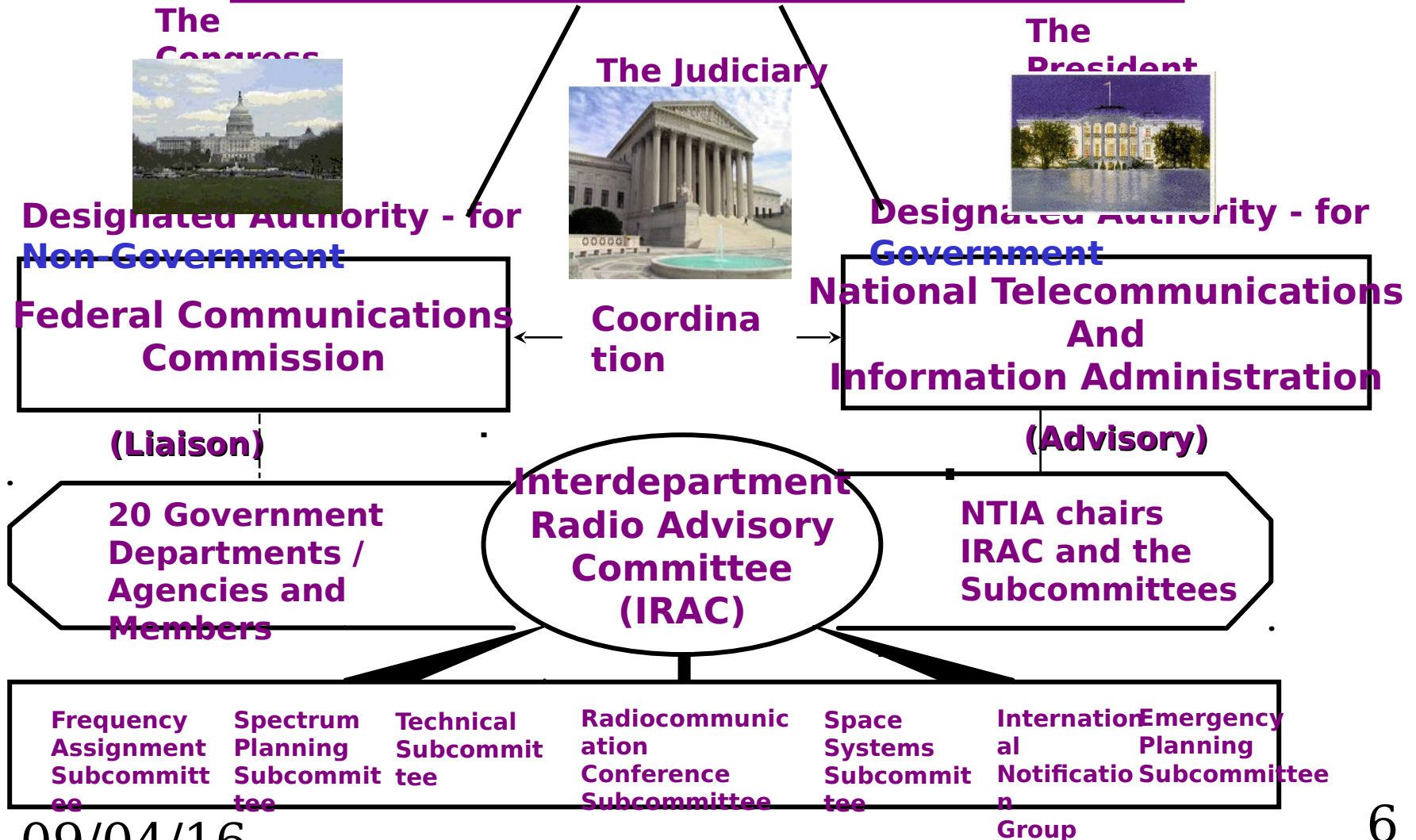
Influences Affecting Supportability

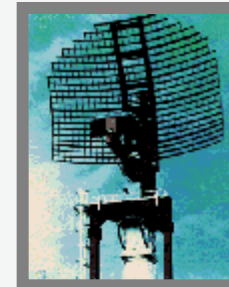
- Market Forces
 - Wireless explosion
 - Broadband
- New & Emerging Technologies
 - Ultra wideband
 - Cognitive Radios
 - Adaptable Antennas
- Legislative
 - GAO Report
 - National Defense Auth Act (FY04)
- Regulatory
 - Presidential Initiative (Spectrum Policy for the 21st Century)
 - Licensed vs Unlicensed (Commons) Debate



US Spectrum Management History and Organization

Communications Act of 1934





Radio Frequency
Allocation

- **Spectrum Management Is Complex:**

- Frequency bands carved up into “segments”
- Services often stacked in same band

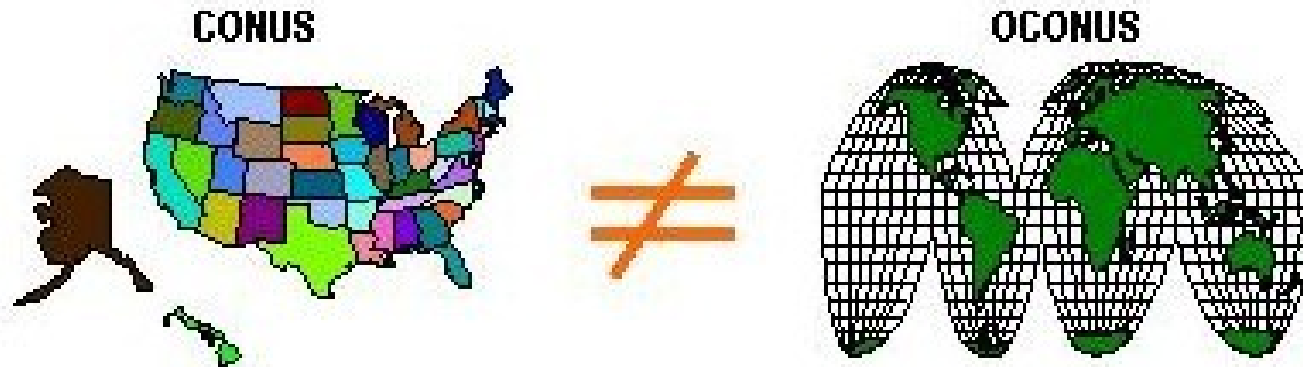
- **DoD Has *VERY* Few Exclusive allocations**

- **By international law, countries can allow or disallow any spectrum use within their borders**

- **No Internationally recognized spectrum reserved exclusively for military use**



Spectrum Allocation is not Universal



| Band | United States | Europe |
|-------------|--|---|
| 902-928 MHz | ISM* – Baby monitors Bar code readers | Tactical radio relay Personal mobile radio |
| 420-450 MHz | Radiolocation, EPLRS | Land Mobile Radio |

International & Regional Spectrum Management Forums

Each Nation has Sovereignty Over the Use of its Spectrum

The US has only one vote!

Inter-American
Telecommunication
Commission
(CITEL)
(35)



African
Telecommunications Union
(ATU)
(46)



League of
Arab States
(LAS)
(22)



European
Conference of
Postal and
Telecommunications
Administrations
(CEPT)
(43)



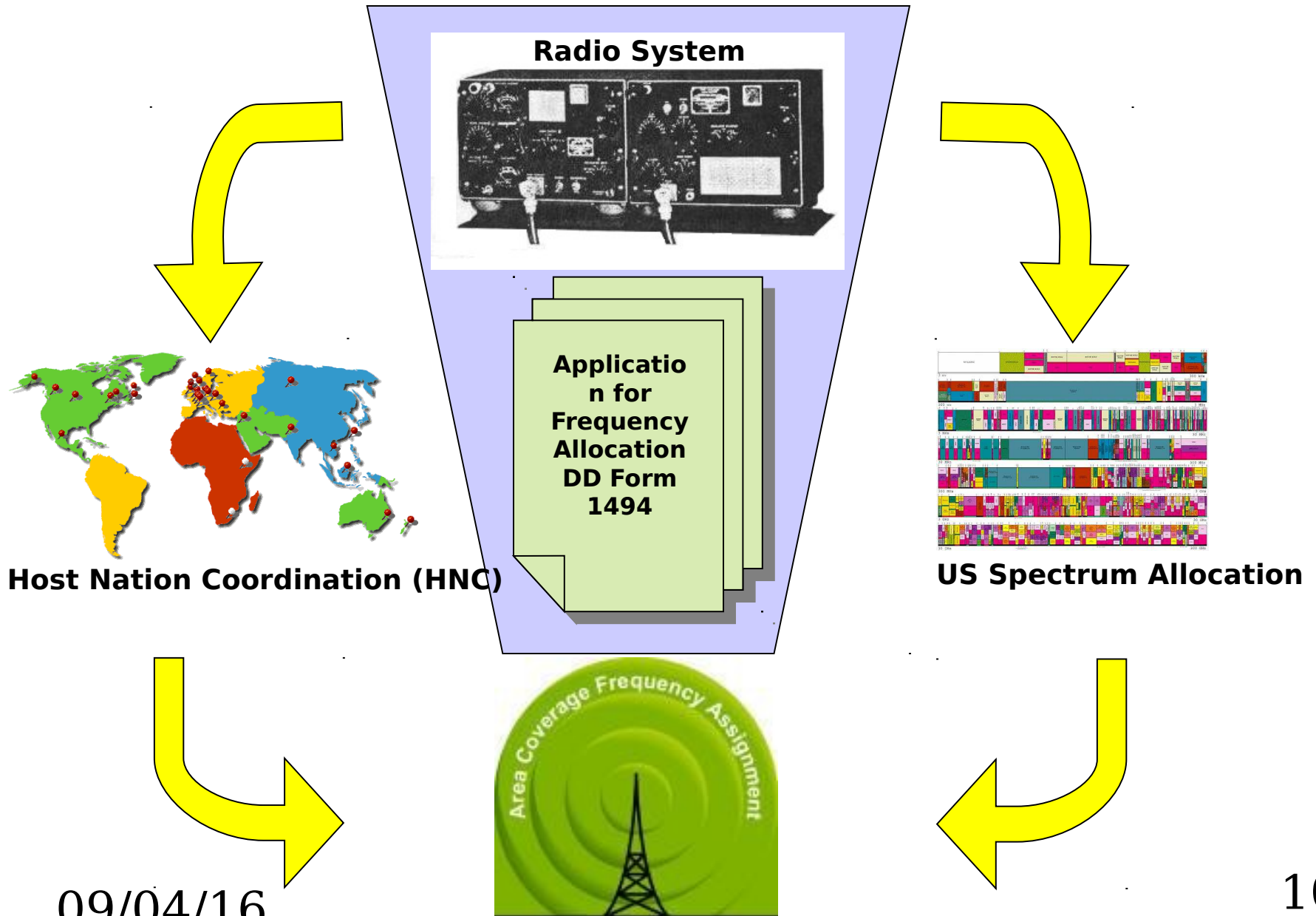
Asia-Pacific
Telecommunity
(APT)
(35)

International Telecommunication Union (ITU)
(189 Voting Member Nations; 650 Sector Non-Voting Members)

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NOTE: Some Countries are Members of More Than One Organization. Example:
US is a CITEL and NATO Member

Spectrum Supportability Processes

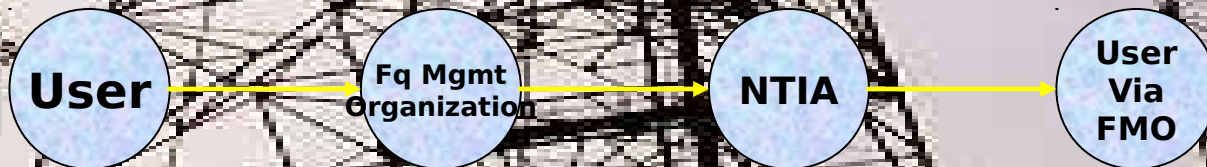


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Frequency Assignments

- License to operate a spectrum dependent device
- Regular (permanent), Temporary, Trial
- Approval lead times vary with nature of application

CONUS



OCONUS



Spectrum Certification Compliance (DD Form 1494)

| | | |
|--|--|---|
| Statutory: | DoDI 5000.2, Operation of the Defense Acquisition System | |
| Applicable to all systems/equipment that require use of the electromagnetic spectrum | <ul style="list-style-type: none"> • 47 U.S.C. 303 • Pub. L. 102-538, 104) • 47 U.S.C. 901-904 • OMB Circular A-11, Part 2 • DoD Directive 4650.1 | MS B MS C (if no MS B) |

DD Form 1494

Stages

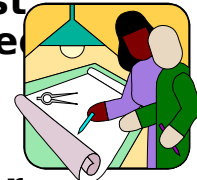
• Stage 1: Conceptual

- Initial planning complete, including proposed frequency bands



• Stage 2: Experimental

- Preliminary design complete, radiation using test equipment and preliminary models may be required



• Stage 3: Developmental

- Major design complete and radiation required for testing



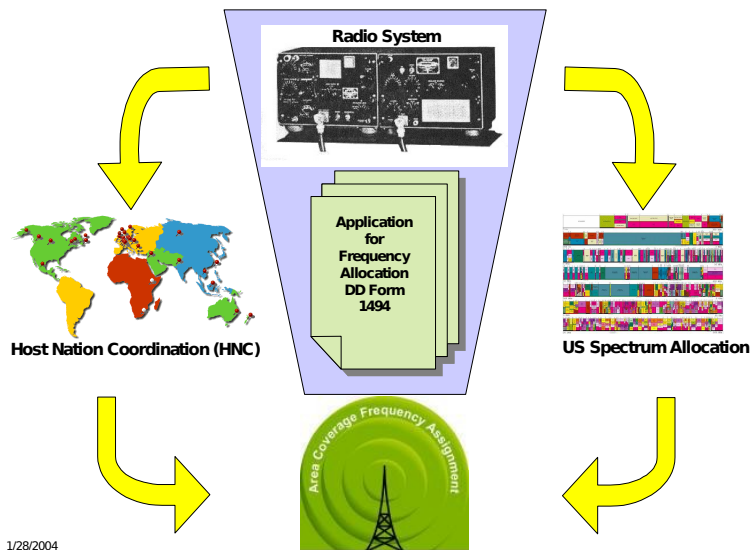
• Stage 4: Operational

- Development is complete and final operating constraints or restrictions required to assure

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Spectrum Certification

Spectrum Supportability Processes



1/28/2004

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**Authority to
experiment, develop
or procure new
spectrum-dependent
equipment.**

**A 'Building Permit' to use the
airwaves**



Train as you fight



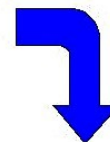
Maintain Readiness



Sustain Operational Capability

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No Spectrum Certification



No Frequency Assignment



Operate Equipment

- Train as you fight
- Maintain Readiness
- Sustain Operational Capability

13

Commercial off the Shelf (COTS)



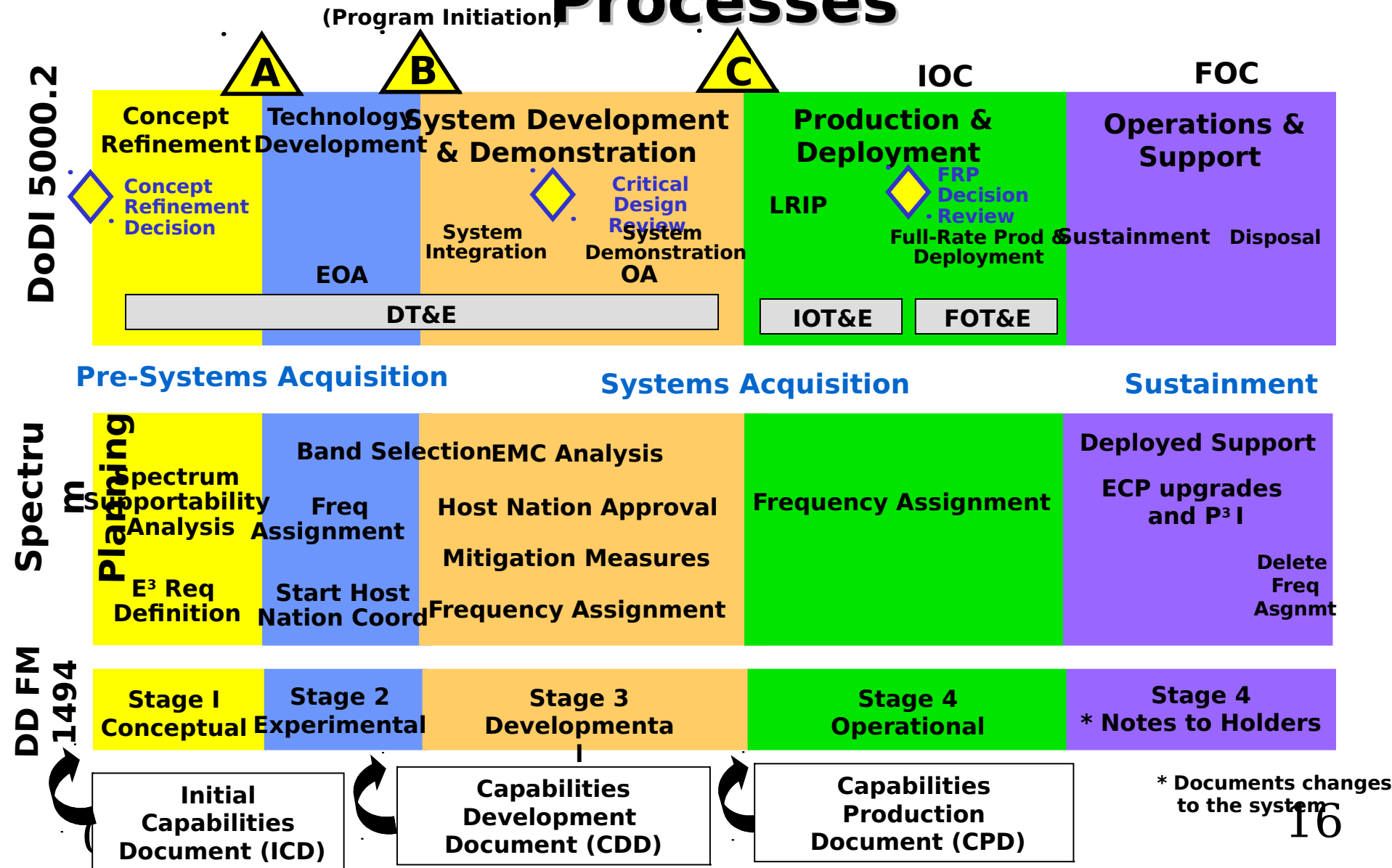
- COTS seen as a “favored” solution
 - Development costs decreased
- Problems
 - Frequency bands not similar internationally
 - Government use of Non-Government bands is restricted
 - Equipment cannot be modified in ANYWAY

Host Nation Coordination/Approval

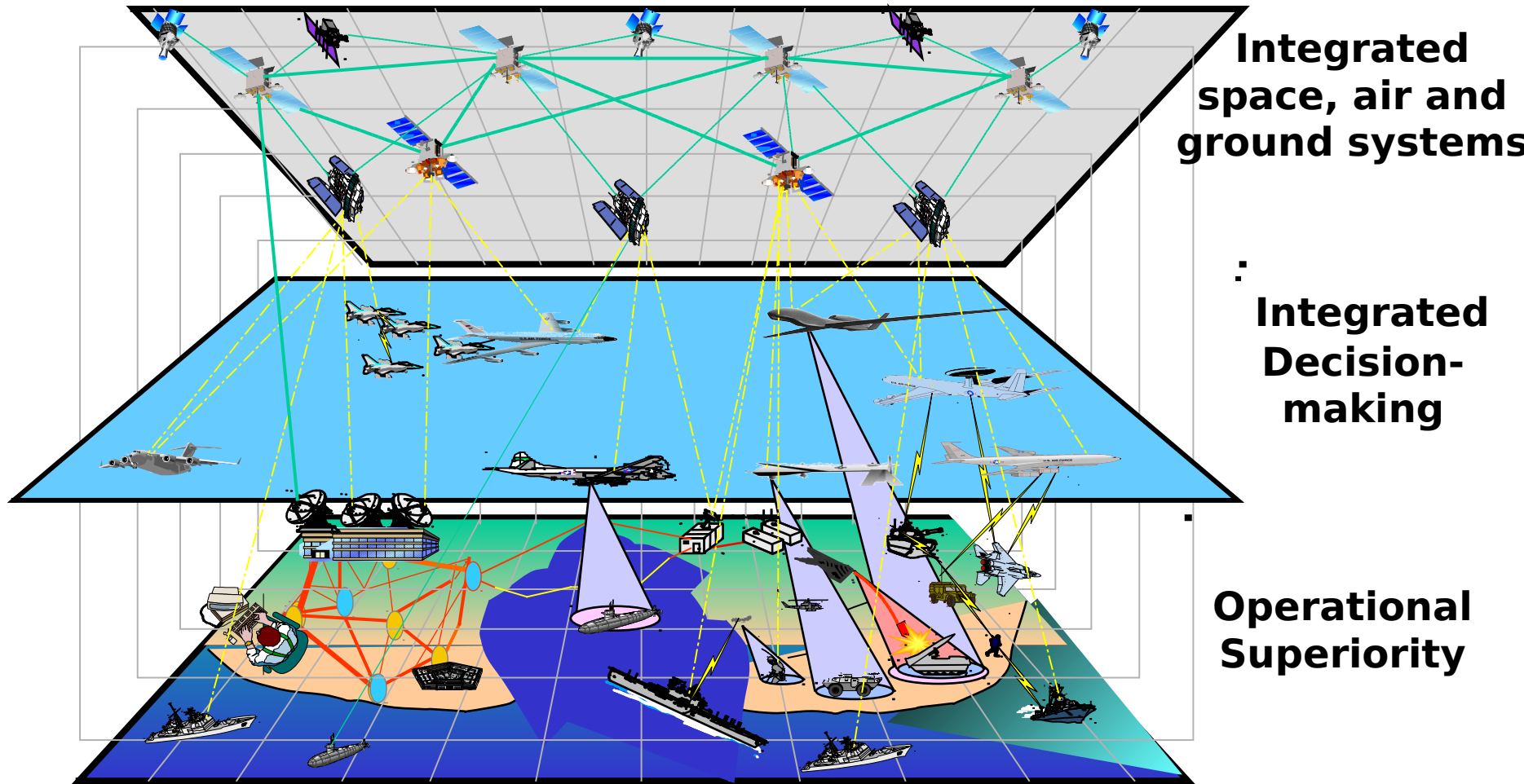


- Different Process in every Country
- Host Nations have Sovereign Authority
- Band Flexibility maximizes Supportability

Notional Integration of Spectrum Management and Acquisition Processes



Goal: Globally Deployable Capabilities



Net-centric Operations and Warfare depend on Spectrum A
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Points of Contact

Army

- armyspecmgmt@hqda.army.mil
- (703) 325-8226/DSN 221-8226

Air Force:

- affma@pentagon.af.mil
- (703) 428-1544/DSN

Navy/Marine Corps:

- navyspectrum@navemscen.navy.mil
- (703) 325-2714/DSN 221-2714

Defense Spectrum Office

- dso@ncr.disa.mil
- (703) 325-2567/DSN 221-

http://acc.dau.mil/simplify/ev_en.php

